

WHAT IS CLAIMED IS:

1. A modular cooling loop system for cooling a manufacturing process machine, said cooling loop system connectable to a chilled water supply system and the manufacturing process machine, said cooling loop system comprising:

a movable chassis; and

a coolant piping loop mounted on said chassis and comprising:

a pump;

a plurality of coolant inlets;

a plurality of coolant outlets;

a plurality of temperature sensors for measuring coolant temperature in said coolant piping loop;

a flow sensor for measuring coolant flow in said coolant piping loop;

and

a flow control valve for controlling the flow of fresh coolant into said coolant piping loop;

said coolant piping loop configured to recirculate coolant through said coolant piping loop and the manufacturing process machine.

2. A modular cooling loop system in accordance with Claim 1 wherein said plurality of coolant inlets comprise:

a main coolant inlet configured to connect to the chilled water system;

and

at least one coolant inlet configured to connect to the manufacturing process machine.

3. A modular cooling loop system in accordance with Claim 1 wherein said plurality of coolant outlets comprise:

a main coolant outlet configured to connect to the chilled water system;
and

at least one coolant outlet configured to connect to the manufacturing process machine.

4. A modular cooling loop system in accordance with Claim 1 wherein said plurality of temperature sensors comprise:

a first temperature sensor to measure the temperature of the incoming coolant from the chilled water system;

a second temperature sensor to measure the temperature of the coolant before entering the manufacturing process machine; and

a third temperature sensor to measure the temperature of the coolant leaving the manufacturing process machine.

5. A modular cooling loop system in accordance with Claim 1 wherein said movable chassis comprises a plurality of wheels.

6. A modular cooling loop system in accordance with Claim 1 further comprising a controller mounted on said chassis and operationally coupled to said plurality of temperature sensors, said flow sensor, and said flow control valve.

7. A modular cooling loop system in accordance with Claim 1 further comprising a pump controller mounted on said chassis and operationally coupled to said pump.

8. A portable cooling loop system for controlling coolant in a manufacturing process machine, said cooling loop system connectable to a chilled water supply system and the manufacturing process machine, said cooling loop system comprising:

a chassis comprising a plurality of wheels to enable said chassis to move;

a coolant piping loop mounted on said chassis and comprising:

a main cooling water inlet line configured to connect to the chilled water system, said main cooling water inlet comprising a first temperature sensor;

a pump;

at least one cooling water outlet configured to connect to the manufacturing process machine to supply cooling water;

at least one cooling water inlet configured to connect to the manufacturing process machine to receive spent cooling water;

a main cooling water outlet configured to connect to the chilled water system;

a flow control valve located in said main cooling outlet line;

a second temperature sensor located upstream from said at least one cooling water outlet; and

a third temperature sensor located down stream from said at least one cooling water inlet.

9. A portable cooling loop system in accordance with Claim 8 further comprising a flow sensor located downstream from said pump.

10. A portable cooling loop system in accordance with Claim 9 further comprising a controller mounted on said chassis and operationally coupled to said first, second, and third temperature sensors, said flow sensor, and said flow control valve.

11. A portable cooling loop system in accordance with Claim 8 further comprising a pump controller mounted on said chassis and operationally coupled to said pump.

12. A method of cooling a manufacturing process machine, said method comprising:

coupling a modular cooling loop system to the process machine;

coupling the modular cooling loop system to a chilled water system;

and

circulating chilled water coolant through the process machine utilizing the modular cooling loop system to maintain a pre-selected process temperature and a pre-selected coolant flow rate;

the modular coolant loop system comprising a movable chassis, and a coolant piping loop mounted on the chassis, the coolant piping loop comprising:

a pump;

a plurality of coolant inlets;

a plurality of coolant outlets;

a plurality of temperature sensors for measuring coolant temperature in the coolant piping loop;

a flow sensor for measuring coolant flow in the coolant piping loop;

and

a flow control valve for controlling the flow of fresh coolant into the coolant piping loop;

the coolant piping loop configured to recirculate coolant through the coolant piping loop and the manufacturing process machine.

13. A method in accordance with Claim 12 wherein the plurality of coolant inlets comprise a main coolant inlet configured to connect to the chilled water system, and at least one coolant inlet configured to connect to the manufacturing process machine.

14. A method in accordance with Claim 13 wherein the plurality of coolant outlets comprise a main coolant outlet configured to connect to the chilled water system, and at least one coolant outlet configured to connect to the manufacturing process machine, said coupling a modular cooling loop system to the process machine comprises:

attaching the at least one coolant outlet to the process machine; and

attaching the at least one coolant inlet to the process machine.

15. A method in accordance with Claim 14 wherein said coupling the modular cooling loop system to a chilled water system comprises:

attaching the main coolant inlet to the chilled water system; and

attaching the main coolant outlet to the chilled water system.

16. A method in accordance with Claim 12 wherein said plurality of temperature sensors comprise:

a first temperature sensor to measure the temperature of the incoming coolant from the chilled water system;

a second temperature sensor to measure the temperature of the coolant before entering the manufacturing process machine; and

a third temperature sensor to measure the temperature of the coolant leaving the manufacturing process machine.

17. A method in accordance with Claim 16 wherein the coolant piping loop further comprises a programmable controller mounted on the chassis and

operationally coupled to the first, second, and third temperature sensors, the flow sensor, and the flow control valve, said method further comprising monitoring the first, second, and third temperature sensors with the programmable controller and adjusting the flow control valve to maintain the pre-selected process temperature.

18. A method in accordance with Claim 17 wherein said adjusting the control valve comprises sending a command from the programmable controller to the flow control valve.

19. A method in accordance with Claim 17 wherein the coolant piping loop further comprises a pump controller mounted on the chassis and operationally coupled to the pump and the programmable controller, said method further comprising monitoring the flow sensor with the programmable controller and adjusting the pump to maintain the pre-selected coolant flow rate.

20. A method in accordance with Claim 19 wherein said adjusting the pump comprises:

sending a command from the programmable controller to the pump controller; and

sending a command from the pump controller to the pump.